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THE INTENSITY OF ASSORTIVE PAIRING IN CHROMODORIS<sup>1</sup>

THE pairing of the hermaphroditic nudibranch *Chromodoris zebra* is accomplished in such a manner that there occurs a considerable degree of assortive conjugation with respect to size. A report<sup>2</sup> presenting evidence in support of this conclusion was based upon the examination of *Chromodoris* population in Great Sound, Bermuda, at a season when a considerable percentage of

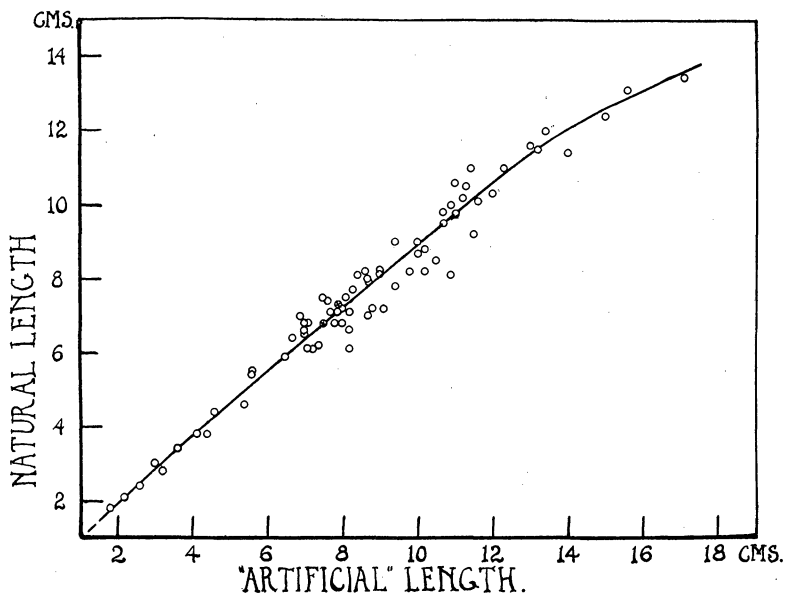


FIG. 1. Curve relating the total length of *Chromodoris* of various sizes to the "length" as obtained from an "artificial" method of measuring the length (see text).

the individuals exhibited injuries of the dorsal region of the mantle. These injuries, resulting in a distortion of the dorsal part of the body, made it necessary in estimating size to measure the total length of the animals—from anterior edge of the buccal veil to posterior termination of the foot. For practical purposes it was necessary at that time to employ a somewhat artificial

<sup>1</sup> Contributions from the Bermuda Biological Station for Research, No. 115.

<sup>2</sup> Crozier, W. J., "Assortive Mating in a Nudibranch, *Chromodoris zebra* Heilprin," *Jour. Exp. Zool.*, Vol. 27, pp. 247-292, 1918 (cf. *Proc. Nat. Acad. Sci.*, 1917, Vol. 3, pp. 519-522).

method in measuring this length. The animals were placed, dorsal surface downward, upon a glass plate freshly wetted with sea-water. It was recognized<sup>2</sup> that the soft body of these nudibranchs was by this procedure flattened out, and to some extent increased in length, and that the proportionate amount of distortion might be different for animals of different sizes. Opportunity was therefore subsequently taken to establish the relation

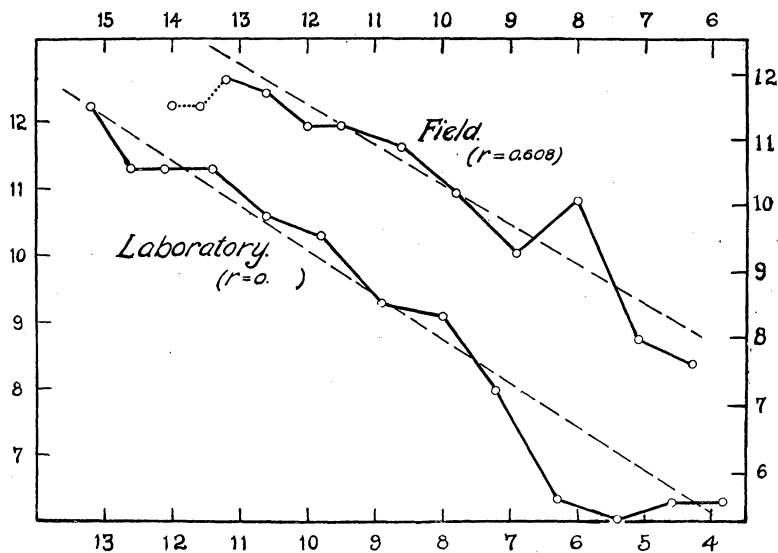


FIG. 2. Regression plots; upper, from 148 pairs copulating in nature; lower, from 119 pairs formed in aquaria; abscissas, length-classes in cms.; ordinates, the mean lengths of the mates of the nudibranchs in each of the corresponding length-classes; length measurements reduced by means of Fig. 1. The regression lines are those previously found (see 2), employing the length as "artificially" determined, and on the assumption that the regression is essentially linear.

between the "artificial" length as previously measured, and the total length of the nudibranch as normally creeping on a flat surface. The lengths of 74 individuals were determined in each of these ways. The result of these measurements is exhibited in Fig. 1.

It is apparent that with nudibranchs of the larger sizes the "normal" length is 1-2 cm. less than the length as artificially estimated; further, that, as was to be expected, the extent of the distortion introduced by the latter method is proportionately greater in larger specimens, the effect being negligible below 3 cm. Accepting the curve as a measure of the relation desired,

Fig. 2 contains regression plots for my data<sup>2</sup> on pairs found in nature and for laboratory matings in mass experiments, the length-classes having been redistributed according to their respective values in terms of the "normal" length. This procedure involves the assumption that the proportion of flattening in the "artificial" method is the same for animals of the same size-class at different seasons, which is probably not quite exact. The original records were obtained in April-May, 1917, whereas the data for Fig. 1 were secured in September, 1918. In the presence of so many possible sources of variation as these measurements permit, it is sufficient to "average" the determinations graphically, each original length-class, and the corresponding mean length of the mates of individuals in this class, being treated as units in reducing the old "length" figures to the more natural ones obtained through Fig. 1.

According to Fig. 2, the apparent intensity of homogamy in *Chromodoris* is but little affected, if anything perhaps slightly improved, by the reduction of the original figures to the natural scale.

W. J. CROZIER.

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## THE ORIGIN OF THE INTOLERANCE OF INBREEDING IN MAIZE

THE marked intolerance of inbreeding in maize has recently been discussed by Collins<sup>1</sup> and brought to the support of the hypothesis that this plant is of hybrid origin. But to those who look for the origin of maize in another direction, the problem is capable of a very different solution.

Briefly stated, Collins' argument is this: Most varieties of maize suffer from a few generations of self-pollination, but teosinte does not seem to be affected by this treatment. The maize plant as a whole is usually synacmic, with a tendency toward protandry, and self-pollination is in a large degree possible; such inflorescences of maize as have both stamens and pistils are distinctly protogynous. In teosinte the large number of inflorescences on a single plant makes self-pollination a common thing. If maize arose from teosinte, what was the origin of its intolerance of inbreeding? The assumption that maize is

<sup>1</sup> Collins, G. N., "Intolerance of Maize to Self-fertilization," *Jour. Washington Acad. Sci.*, 9: 309-312, 1919.